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WHAT IS CLAIMED IS:

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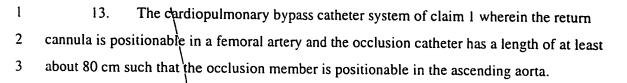
than about 250 mm Hg.

1. A cardiopulmonary bypass catheter system for arresting a patient's heart and			
maintaining arterial circulation comprising:			
a return cannula having an elongated cannula body, a distal end adapted for			
positioning in a blood vessel, a proximal end, a return lumen in the cannula body adapted for			
flowing blood therethrough, a return outlet at the distal end in communication with the return			
lumen, a return inlet at the proximal end in communication with the return lumen, a catheter			
port at the proximal end in communication with the return lumen and adapted to removably			
receive a catheter therein, and a hemostasis valve in the catheter port adapted to seal around a			
catheter positioned in the catheter port; and			
an occlusion catheter slidably and removably positioned through the catheter port and			
the return lumen, the occlusion catheter having an infusion lumen with an infusion inlet and			
an infusion outlet, the infusion inlet being adapted for connection to a source of cardioplegic			
fluid, and an expandable occlusion member proximal to the infusion outlet having a collapsed			
configuration adapted for introduction through the return tumen and an expanded			
configuration adapted for occlusion of the ascending ageta between the coronary ostia and the			
brachiocephalic artery;			
wherein the return lumen is adapted to deliver blood when the occlusion catheter is			
positioned therein at a flow rate sufficient to maintain arterial circulation with the heart			
arrested.			
2. The cardiopulmonary bypass catheter system of claim 1 further comprising a			
venting port in communication with the infusion lumen, the venting port being adapted for			
connection to a pump for withdrawing fluids from the ascending aorta through the infusion			
lumen.			
3. The cardiopulmonary bypass catheter system of claim 1 wherein the return			

lumen is adapted to deliver blood at a flow rate of at least about 4 l/min and a pressure of less

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1	4.	The cardiopulmonary bypass catheter system of claim 1 wherein the return	
2	lumen has an inner diameter of about 5-9mm.		
ì	5.	The cardiopulmonary bypass catheter system of claim 4 wherein the occlusion	
2	catheter has a	n outer diameter of about 2-5mm.	
1	6.	The cardiopulmonary bypass catheter system of claim 1 further comprising a	
2	source of card	lioplegic fluid coupled to the infusion port.	
1	7.	The card opulmonary bypass catheter system of claim 1 further comprising a	
2	source of oxygenated blood coupled to the infusion port.		
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l	8.	The cardiopulmonary bypass catheter system of claim 1 further comprising a	
2	pump coupled	to the return inlet adapted for pumping oxygenated blood through the return	
3	lumen.		
1	9.	The cardiopulmonary bypass catheter system of claim 8 wherein the pump is	
2	adapted to pur	np oxygenated blood through the return lumen at a rate of at least about 4 l/min.	
3	at a pressure of less than about 250 mm Hg with the occlusion catheter positioned in the		
4	return lumen.		
1	10.	The cardiopulmonary bypass catheter system of claim I wherein the infusion	
2	lumen is confi	gured to deliver dardioplegic fluid at a rate of at least 250 ml/min at a pressure	
3	of less than ab	out 300 mm Hg.	
1	11.	The cardiopulmonary bypass catheter system of claim 10 wherein the infusion	
2	lumen has a co	ross-sectional area of at least about 4.5 mm ² .	
i	12.	The cardiopulmonary bypass catheter system of claim 1 further comprising a	
2	venous cannula positionable in a vein and an oxygenator fluidly coupled to the venous		
3	cannula, the oxygenator being fluidly coupled to the return inlet.		



- 14. The card opulmonary bypass catheter system of claim 1 wherein the occlusion catheter has a pre-shaped distal portion configured to conform to at least a portion of the aortic arch.
- 1 15. The cardiopulmonary bypass catheter system of claim 1 wherein the occlusion catheter has a pressure lumen with a pressure outlet distal to the occlusion member and a pressure port proximal to the occlusion member adapted for connection to a pressure monitoring device.
 - 16. A cardiopulmonary bypass catheter system for arresting a patient's heart and maintaining arterial circulation comprising:

a return cannula having an elongated cannula body, a distal end adapted for positioning in a blood vessel, a proximal end, a return lumen in the cannula body adapted for flowing blood therethrough, a return outlet at the distal end in communication with the return lumen, a return inlet at the proximal end in communication with the return lumen, a catheter port at the proximal end in communication with the return lumen and adapted to removably receive a catheter therein, and a hemostasis valve in the catheter port adapted to seal around a catheter positioned in the catheter port;

an occlusion catheter slidably and removably positioned through the catheter port and the return lumen, the occlusion catheter having an infusion lumen with an infusion inlet and an infusion outlet, a venting port in communication with the infusion lumen, and an expandable occlusion member proximal to the infusion outlet having a collapsed configuration adapted for introduction through the return lumen and an expanded configuration adapted for occlusion of the ascending aorta between the coronary ostia and the brachiocephalic artery;

a return pump coupled to the return inlet and adapted for pumping oxygenated blood through the return lumen with the occusion catheter positioned therein at a flow rate sufficient to maintain arterial circulation with the heart arrested;



a source of cardioplegic fluid coupled to the infusion port; and a venting pump coupled to the venting port for withdrawing fluids from the ascending aorta through the infusion lumen.

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